REMARKS

In the above-referenced Office action, dependent claim 20 was objected to as being confusing and unclear. Appropriate correction was required. In response, dependent claim 20 was amended for the sake of clarity. Accordingly, the objection of dependent claim 20 should be withdrawn.

Also, in the same Office action, claims 1-3 and 12 were rejected under 35 U.S.C. 102(b) as being anticipated by the U.S. Patent No. 5,892,677 (hereinafter Chang '677); and dependent claims 4-5, independent claim 15 and claims 16-20 dependent from claim 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '677 in view of U.S. Patent No. 6,778,414 (hereinafter Chang '414). Dependent claims 6-11 were objected to as being dependent upon a rejected base claim, but would be allowed if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response, independent claim 1 and claim 4 dependent therefrom were amended to render the recitation thereof more definite in particularly pointing out the invention intended to be claimed by the Applicants. Support for the claim amendments can be found in Figures 6 and 8A-8G and the associated descriptive text in the specification of the instant application. More specifically, the opto-couplers PD1/PT1 and PD2/PT2 provide a monitoring of the polarity relationship of the first and second busses as shown by the waveforms of Figures 8A-8C, for example. The control circuit 12 is enabled/disabled by the opto-coupler PD3/PT3 (see also Figure 7) as shown by the exemplary waveform of Figure 8D. Upon being enabled (see rising edge of waveform 8D), the first (FET-2) and second (FET-1) switches are sequentially controlled into conductive states (see rising edges of Figures 8E and 8F) based on said monitored polarity relationship (by flip-flops FF1 and FF2 using rising edges of 'POS' and 'NEG' signals). Upon being disabled (see falling edge of waveform 8D), the first (FET-2) and second (FET-1) switches are sequentially controlled into non-conductive states (see falling edges of Figures 8E and 8F) based on said monitored polarity relationship (by flip-flops FF1 and FF2 using rising edges of 'POS' and 'NEG' signals).

Except for dependent claim 20 as noted above, the remaining claims 2-3, 6-19 are as originally filed.

The merit rejections of the claims 1-5 and 12-20 are respectfully traversed and the following remarks are provided in support of this position.

Chang '677 is directed to an AC-AC power converter module (10, Fig. 2a) which uses bidirectional AC power switches (Fig. 2b) to convert a three-phase AC power source a_i, b_i, and c_i to a single-phase AC source PT1/PT2 with variable-voltage and variable-frequency control (see col. 3, line 66 to col. 4, line 3). The transistor pairs T1-T2, T3-T4, and T5-T6 of the AC power switches are controlled by the circuits of Figure 5 in accordance with the state diagram of Figure 6. Referring to Figure 6, in transitioning directly from a disabled or idle state 0 to one of the steady state conduction states 1, 5 or 11 of the AC switch pairs T1-T2, T3-T4 or T5-T6, respectively, and vice versa, each pair of transistors are controlled concurrently to their conductive or non-conductive states. That is, the binary states of the control signals G1-G6 for the respective switches T1-T6 transition directly from 000000 (state 0, idle) to either 110000 (state 1), or 001100 (state 5) or 000011 (state 11), where a binary "1" indicates control of the respective transistor to a conducting state and a binary "0" indicates control of the respective transistor to a non-conducting state (see col. 6, lines 24-50). Accordingly, Chang '677 does not teach or suggest a sequential control of any of the switch pairs T1-T2, T3-T4 and T5-T6 upon being enabled or disabled.

Chang '414 appears to employ a similar AC bidirectional switch (48, Fig. 4) as that taught by Chang '677 in a system for electrical power regulation, conditioning and distribution on an aircraft. The examiner asserts that Chang '414 in col. 2, lines 50-57 discloses a control circuit governed by an enable signal to control the first and second switches based on a monitored polarity relationship. Applicants can no support for the examiner's assertion in the referenced text of Chang '414. Actually, the referenced text appears to teach nothing more than what Chang '677 is teaching.

Neither Chang '677 nor Chang '414 are directed to solving the problem of EMI generation as a result of zero-crossing power switching posed by the Applicants in the Background section of the instant application. Both cited references control the AC switch pairs simultaneously as noted above which causes the same EMI generation problem posed by Applicants in their application.

In contrast to Chang '677 or Chang '414 or the combination thereof, amended independent claim 1 recites, in substance, a control circuit for monitoring a polarity relationship of said first and second phase busses, said control circuit, upon being enabled, operative to control said first and second switches sequentially into conductive states based on said monitored polarity relationship, and, upon being disabled, operative to control said first and second switches sequentially into non-conductive states based on said monitored polarity relationship. As noted above, neither Chang '677 nor Chang '414 teach or suggest control of the first and second switches of their AC bidirectional switches in the manner recited in claim 1. The reason for this is apparent. Neither reference deals with the problem of EMI generation resulting from simultaneous switching of the pair of transistors. Rather, both Chang '677 and Chang '414 teach control of the transistors of each switch pair T1-T2, T3-T4 and T5-T6 concurrently (see state diagram of Figure 6). Accordingly, for at least the foregoing described reasons, amended independent claim 1 is novel and patentably distinguishable over Chang '677 and Chang '414, either taken individually or in combination.

Amended dependent claim 4 includes more specific recitation as to the sequential control of the first and second switches based on the monitored polarity relationship of the phase busses, and, therefore, is novel and patentably distinguishable over the cited references for at least the same reasons given for claim 1. In addition, originally filed claims 2-3 and 5-14 dependent from claim 1, either directly or indirectly, include all of the limitations of their parent claim and, thus, are novel and patentably distinguishable over the cited references for at least the same reasons given above for their parent claim.

Moreover, originally filed independent claim 15 recites, in substance, the steps of: enabling said solid sate relay to supply power from said first and second phase busses to said load; disabling said solid state relay from supplying power from said first and second phase busses to said load; monitoring a polarity relationship of said first and second phase busses; upon said solid state relay being enabled, controlling said first and second switches sequentially to a conductive state based on said monitored polarity relationship; and upon said solid state relay being disabled, controlling said first and second switches sequentially to a non-conductive state based on said monitored polarity relationship. As discussed above, neither Chang '677 nor Chang '414 teach or suggest any such steps. Thus, independent claim 15 is novel and patentably

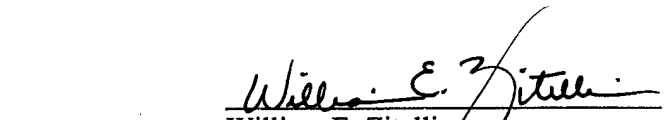
distinguishable over the cited references for at least the same reasons given above for amended claim 1.

Dependent claims 16-20 from claim 15 include all of the limitations of their parent claim, and, thus, are novel and patentably distinguishable over the cited references for at least the same reasons given for their parent claim.

New claims 21 and 22 were added to rewrite allowed dependent claims 6 and 8, respectively, in independent form. New claim 21 includes the limitation of the intervening dependent claim 5. Accordingly, new claims 21 and 22 are allowable for the reasons given by the examiner in the Office action.

In view of the above, all of the new, amended and remaining claims 1-22 of the instant application are considered allowable over the cited references, and the instant application is considered in condition for allowance. Therefore, an early issuance of the instant application is earnestly solicited.

Respectfully submitted,



William E. Zitelli
Attorney for Applicant
Reg. No. 28,551
Tel: 863/471.9365
Email: wzitelli@calfee.com